

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

5 Applicant(s): Gerrit W. Hiddink
Case: 2
Serial No.: 10/751,376
Filing Date: January 5, 2004
Group: 2618
10 Examiner: Nguyen Thanh Vo

Title: Predictive Method and Apparatus for Antenna Selection in a Wireless
Communication System

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REPLY BRIEF

20 Mail Stop Appeal Brief -- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

25 Sir:

Appellants hereby reply to the Examiner's Answer, mailed January 24, 2008
(referred to hereinafter as "the Examiner's Answer"), in an Appeal of the final rejection of
claims 1-7, 11, 13-18, and 22-25 in the above-identified patent application.

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REAL PARTY IN INTEREST

A statement identifying the real party in interest is contained in Appellant's
Appeal Brief.

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RELATED APPEALS AND INTERFERENCES

A statement identifying related appeals is contained in Appellant's Appeal Brief.

STATUS OF CLAIMS

A statement identifying the status of the claims is contained in Appellant's Appeal Brief

STATUS OF AMENDMENTS

A statement identifying the status of the amendments is contained in Appellant's Appeal Brief.

SUMMARY OF CLAIMED SUBJECT MATTER

A Summary of the Invention is contained in Appellant's Appeal Brief

STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A statement identifying the grounds of rejection to be reviewed on appeal is contained in Appellant's Appeal Brief.

CLAIMS APPEALED

A copy of the appealed claims is contained in an Appendix of Appellant's Appeal Brief.

ARGUMENT

Independent Claims 1, 13 and 23

Independent claims 1, 13, and 23 are rejected under 35 U.S.C. §102(b) as being anticipated by Crawford. Regarding claim 1, the Examiner asserts that Crawford discloses a predictive antenna selector that evaluates a signal quality of each of said plurality of antennas based on a weighted schedule (see, paragraphs [0155], [0156], [0163], and [0165] which clearly discloses that an antenna which has poor signal quality during a previous interval will not be scheduled to be evaluated in the next interval; since the schedule for each antenna is not fixed, it reads on weighted schedule as claimed). In the Examiner's Answer, the Examiner asserts that the recitation "weight" as claimed is not required to be defined as "factor assigned to a number in a computation, as in determining an average, to make the number's effect on the computation

reflect its importance” since the “specification is totally silent about any factor, any computation of an average, let alone ‘a factor assigned to a number in a computation, as in determining an average.’” The Examiner asserts that “weight” is also defined as “to bias or slant toward a particular goal or direction, manipulate” The Examiner further asserts that “the schedule for each antenna is not fixed, and actually is biased or manipulated (i.e., an antenna which has poor signal quality during a previous interval will not be scheduled to be evaluated in the next interval).”

Regarding the Examiner’s assertion that the claims do not require Appellants’ definition since the “specification is totally silent about any factor, any computation of an average,” Appellants note that the specification and claims recite the term “weight” and that a “weight” is defined as a “factor.” Appellants also note that a person of ordinary skill *in the art* would interpret a “weight” as a “factor.” Moreover, the Examiner’s assertion that “an antenna which has poor signal quality during a previous interval will not be scheduled” is not evidence of a “weighted schedule” since the cited antenna, as the Examiner acknowledges, is not even scheduled, and thus is not an element of the schedule.

Thus, as previously noted, a “weight” is defined as a “factor assigned to a number in a computation, as in determining an average, to make the number’s effect on the computation reflect its importance.” (See, dictionary.com.) Also, as previously noted, Crawford teaches that,

as an example, assume that $L=5$ receive branches are available. This means that there are a total of $5*4/2=10$ possible chi values that need to be considered. Assume further that the best 6 chi terms are (in descending order of quality): $\lambda_{1,2}$, $\lambda_{2,3}$, $\lambda_{1,4}$, $\lambda_{2,5}$, $\lambda_{4,5}$ and $\lambda_{1,5}$. During the next opportunity to evaluate the receiver branch selection metrics, *the last two chi terms ($\lambda_{4,5}$, and $\lambda_{1,5}$) are dropped and two of the remaining pair possibilities are examined instead $\lambda_{1,3}$, $\lambda_{2,4}$, $\lambda_{3,4}$ and $\lambda_{3,5}$*

Thus, if there are $L=6$ antennas available, the diversity antenna selection can be based on 4 antennas’ measurements (i.e., 6 chi terms) and then the remaining pairs are swapped with the other 2 worst antennas for the next diversity antenna selection performed using subsequent received bursts, again, either later in the same frame or in the next MAC frame.
(Paragraph [0155]-[0156]; emphasis added.)

Crawford does *not*, however, disclose or suggest “weights,” and does *not* disclose or suggest that the signal quality of each of a plurality of antennas are evaluated based on a *weighted schedule*. Independent claims 1, 13, and 23 require that the signal quality of each of a

plurality of antennas are evaluated "based on a *weighted schedule* "

Thus, Crawford does not disclose or suggest that the signal quality of each of a plurality of antennas are evaluated based on a weighted schedule, as required by independent claims 1, 13, and 23.

Claims 5, 17 and 25

In the Examiner's Answer, the Examiner has withdrawn the rejection of claims 5, 17, and 25.

Conclusion

The rejections of the cited claims under sections 102 and 103 in view of Crawford are therefore believed to be improper and should be withdrawn. The remaining rejected dependent claims are believed allowable for at least the reasons identified above with respect to the independent claims.

The attention of the Examiner and the Appeal Board to this matter is appreciated

Respectfully,



Date: March 24, 2008

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APPENDIX

1. A wireless communication device, comprising:

a plurality of antennas; and

5 a predictive antenna selector that evaluates a signal quality of each of said plurality of antennas of at least a portion of one prior frame and selects an antenna to communicate one or more frames based on said signal quality evaluation, wherein said predictive antenna selector evaluates said signal quality of each of said plurality of antennas based on a weighted schedule.

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2. The wireless communication device of claim 1, wherein said predictive antenna selector evaluates a signal quality of each of said plurality of antennas during a preamble portion of a frame.

15 3. The wireless communication device of claim 1, wherein said predictive antenna selector evaluates a signal quality of each of said plurality of antennas for up to an entire frame duration.

20 4. The wireless communication device of claim 1, wherein said predictive antenna selector removes a given antenna from said evaluation if said given antenna fails to satisfy predefined criteria

25 5. The wireless communication device of claim 4, wherein said predefined criteria evaluates whether a signal quality of a given antenna is below a signal quality of a remainder of said plurality of antennas by a predefined amount.

6. The wireless communication device of claim 4, wherein a signal quality of said removed antenna is subsequently evaluated to determine when to return said removed antenna to said plurality of antennas that are evaluated.

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7. The wireless communication device of claim 1, wherein said signal quality of said plurality of antennas is recorded in a table.

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. The wireless communication device of claim 1, wherein said device is implemented in accordance with an IEEE 802.11 Standard.

12. (Cancelled)

13. A method for wireless communication on one of a plurality of antennas, comprising the steps of:

evaluating a signal quality of each of said plurality of antennas of at least a portion of one prior frame based on a weighted schedule; and

selecting an antenna to communicate one or more frames based on said signal quality evaluation for at least one prior frame.

14. The method of claim 13, wherein said evaluating step evaluates a signal quality of each of said plurality of antennas during a preamble portion of a frame.

15. The method of claim 13, wherein said evaluating step evaluates a signal quality of each of said plurality of antennas for up to an entire frame duration.

16. The method of claim 13, wherein said selecting step removes a given antenna from said evaluation if said given antenna fails to satisfy predefined criteria.

17. The method of claim 16, wherein said predefined criteria evaluates whether a signal quality of a given antenna is below a signal quality of a remainder of said plurality of antennas by a predefined amount.

5 18. The method of claim 13, further comprising the step of recording said signal quality of said plurality of antennas in a table.

19. (Cancelled)

10 20. (Cancelled)

21. (Cancelled)

15 22. The method of claim 13, wherein said method is implemented in accordance with an IEEE 802.11 Standard

23. A predictive antenna selector for use in a wireless communication device, comprising:

20 means for evaluating a signal quality of a plurality of antennas of at least a portion of one prior frame based on a weighted schedule; and

 means for selecting an antenna to communicate one or more frames based on said signal quality evaluation for at least one prior frame.

25 24. The predictive antenna selector of claim 23, wherein a given antenna is removed from said evaluation if said given antenna fails to satisfy predefined criteria.

25 25. The predictive antenna selector of claim 24, wherein said predefined criteria evaluates whether a signal quality of a given antenna is below a signal quality of a remainder of said plurality of antennas by a predefined amount.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to § 1.130, 1.131, or 1.132 or entered by the Examiner and relied upon by appellant.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 CFR 41.37.